What Does Biological Diversity Have To Do With All Of This?

- Fresh Water: influence on surface circulation patterns
- The Alaska Marine Highway: plankton and larval transport systems
- Glacial Inputs to Salt Marshes: sediment, nutrients, temperature, and the contribution to the local ecology

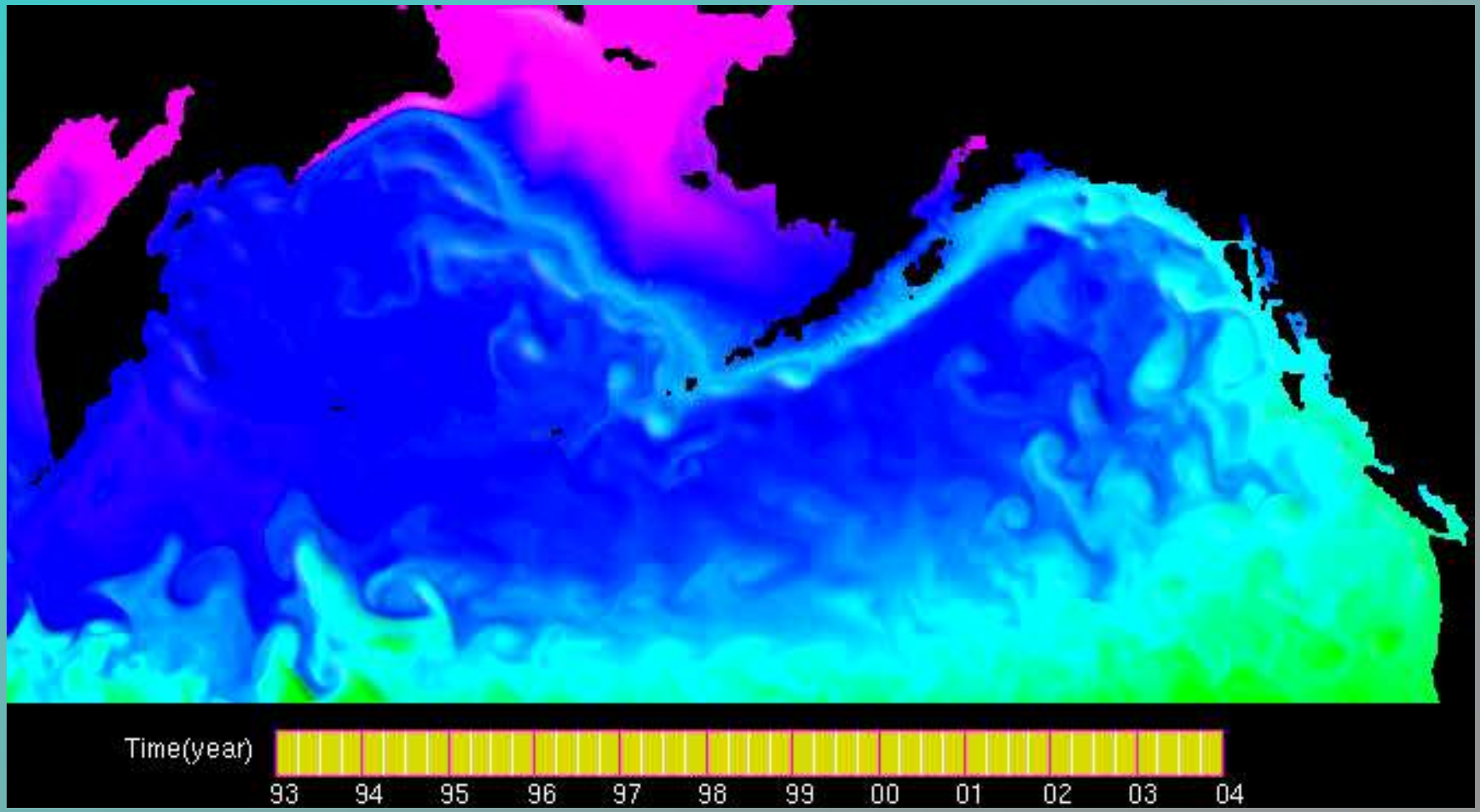
National Estuarine Research Reserve System

Kachemak Bay
Research Reserve

National Estuarine Research Reserve System

Kachemak Bay Research Reserve

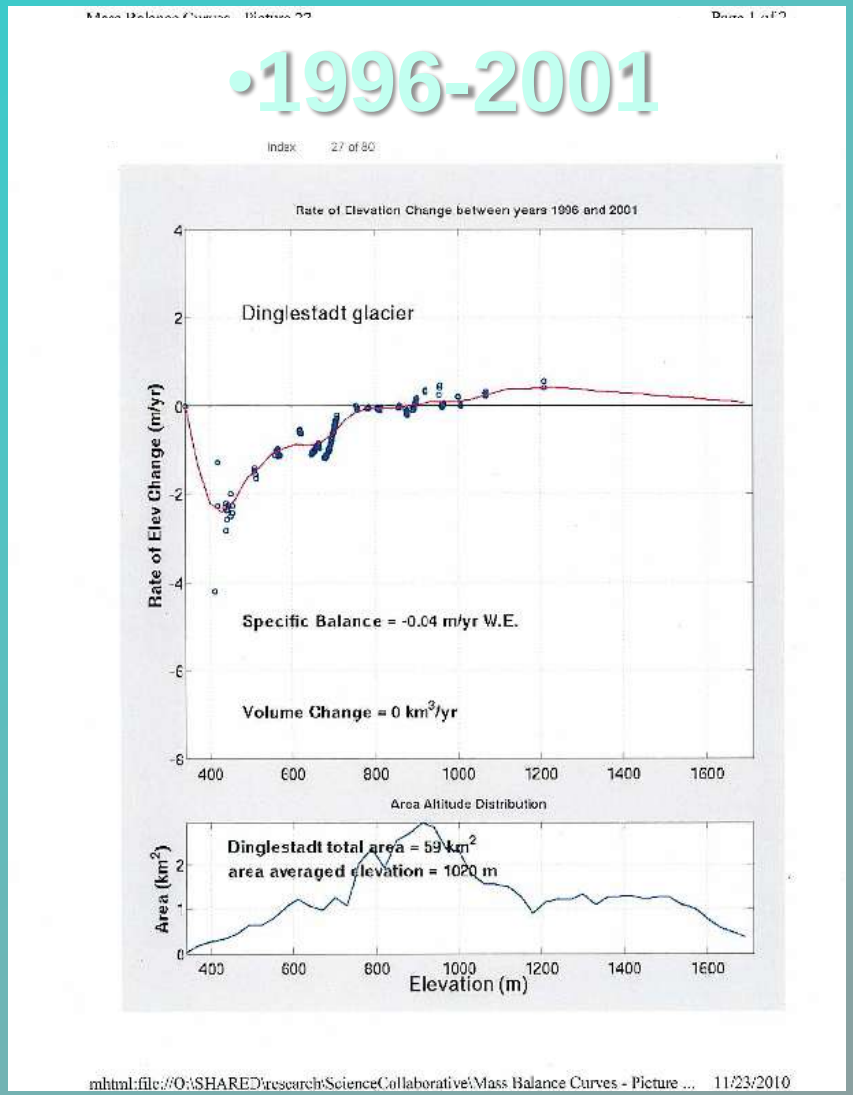
Large Scale Modeling of Sea Surface Temperatures over Time. This model was developed by Yi Chao, JPL



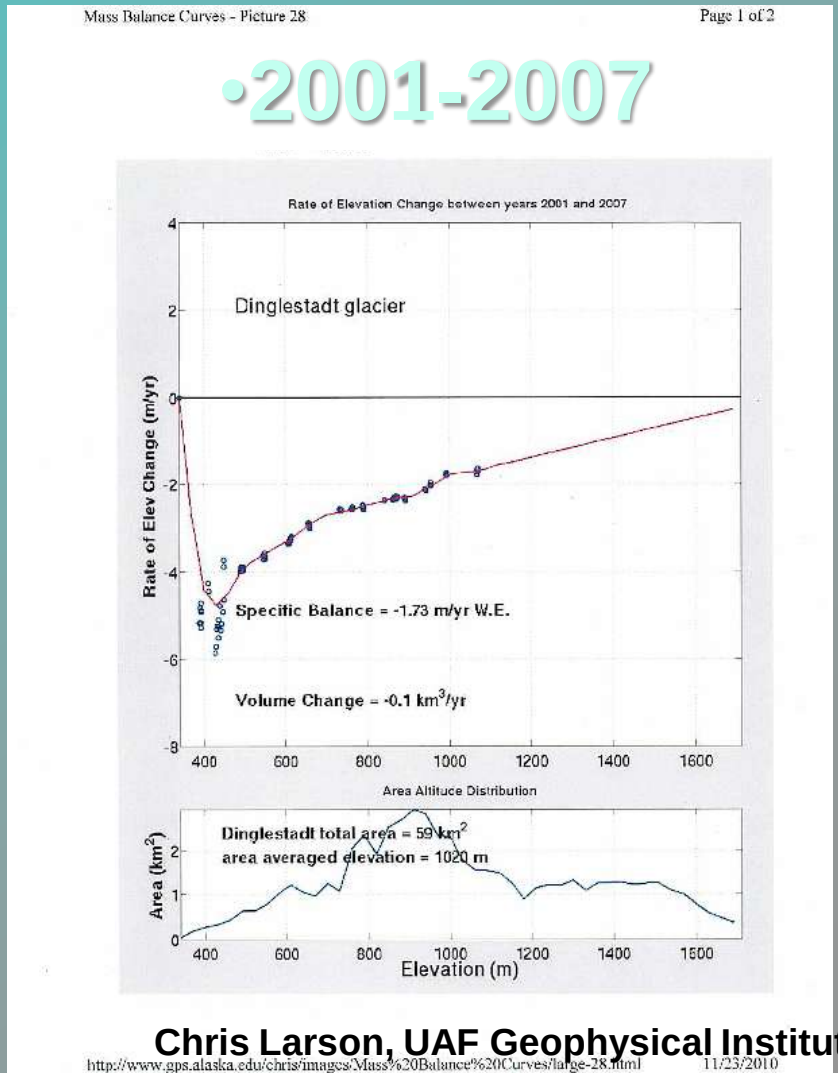
- We can infer patterns of water flow based on color changes (or fronts) in the water
- This is a highly dynamic system and fronts change position
- Glacial melt water contributes to the surface current

Dinglestadt Glacier: Accelerated Decrease in Volume

•1996-2001



•2001-2007



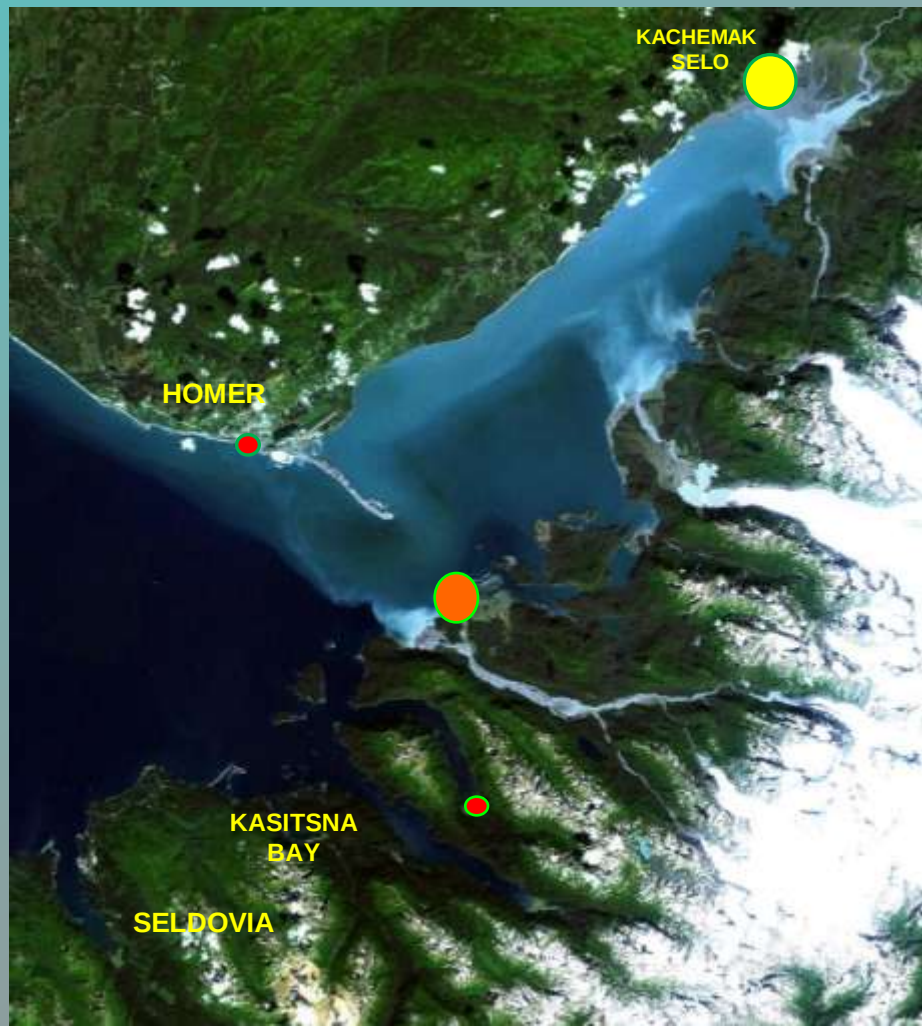
Chris Larson, UAF Geophysical Institute

Methods for Assessing Biological Diversity

..the first steps

Site Selection: where are we proposing to assess biological diversity and why

Salt Marsh Site	Status Relative to Glacial Melt water	Comments
Sadie Cove	>100 years w/o glacial input	
China Poot	No major input since 1964	Altered flow post 1964 quake
Fox River Flats	Strong input	also ground water input
Beluga Slough	No input since the last little ice age?	primarily ground & rain water



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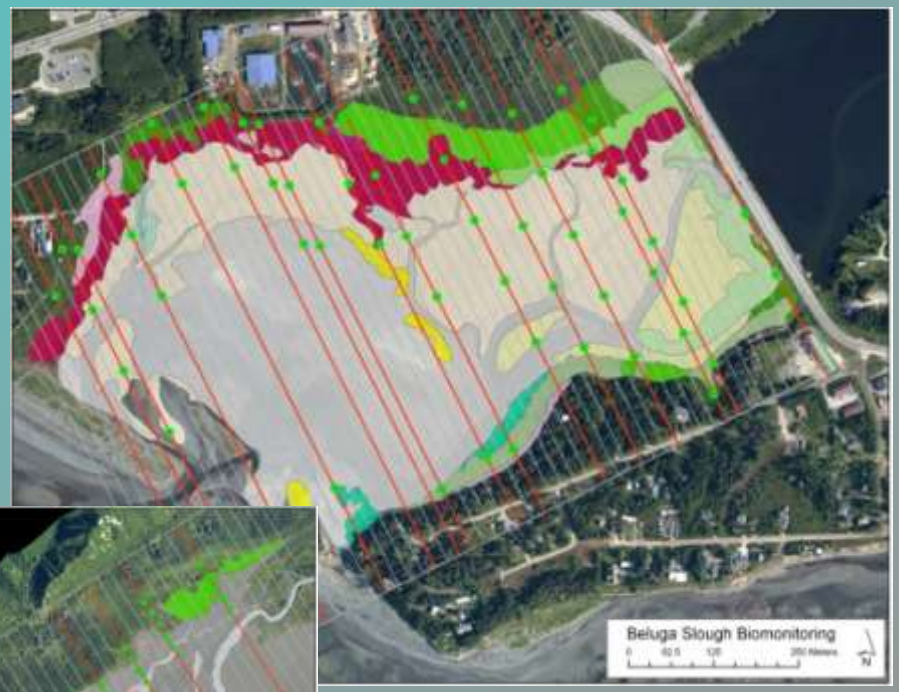
Emergent Vegetation and Substrate:
building on previous KBRR Studies and adding new sites

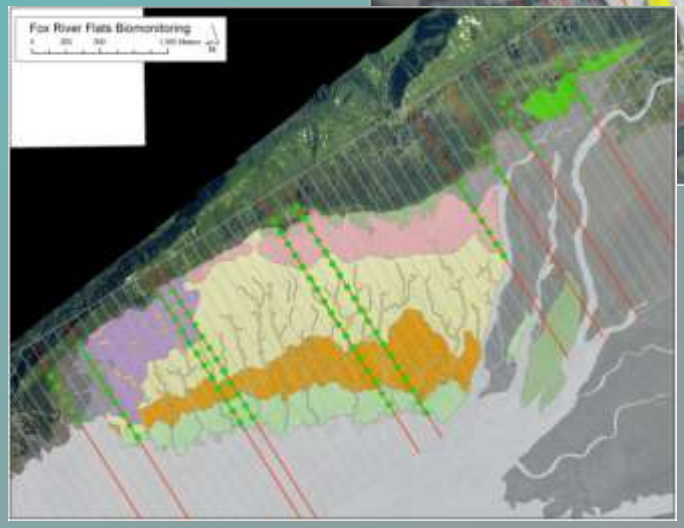
- 1st order vegetation mapping carried out at all sites

- Beluga Slough and Fox River flats have vertically stable benchmarks and validation of vegetation classifications

- Similar work will be conducted for Sadie Cove and China Poot marshes summer 2011

- Additional monitoring will be added to all sites
  - Temperature
  - Water level
  - Assessment of sediment accretion

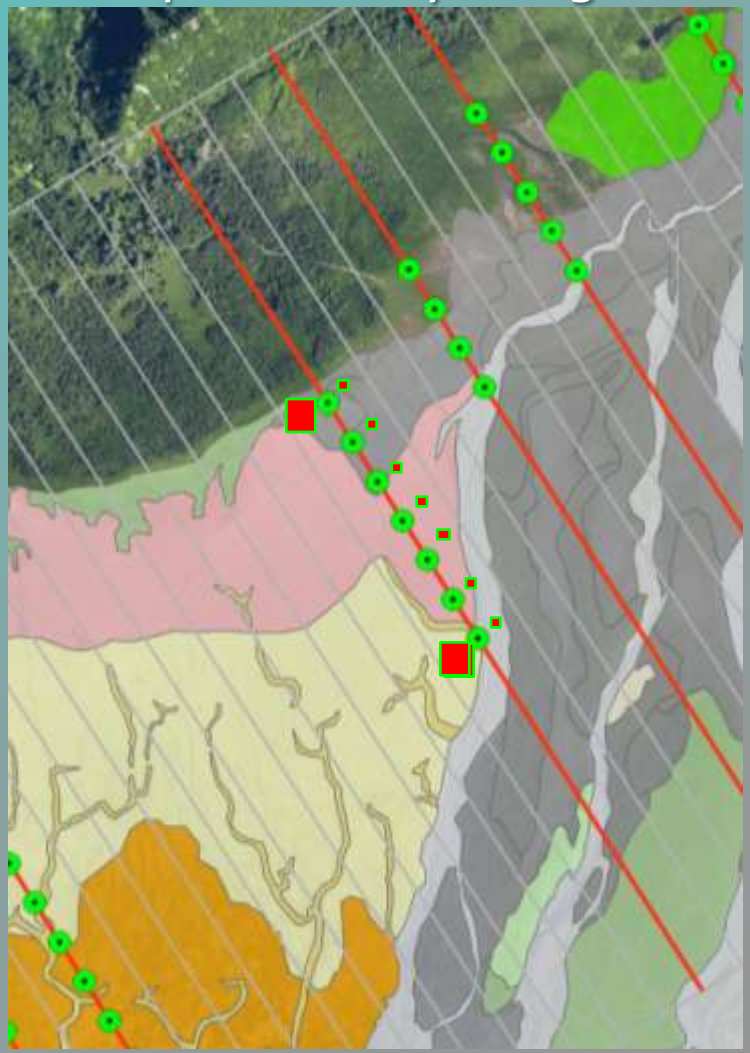




Biological Diversity: beyond vegetation

- Setting up a framework for long-term monitoring
- At each study site, 6 transects will be randomly selected
- A 100m^2 plot will be sampled at high and low marsh levels
- Biologists and community monitors document diversity and relative abundance for the following:
  - Infaunal invertebrates
  - Insects in the vegetation
  - Fish diversity
  - Mammals (presence)
  - Birds

Proposed Study Design



Citizen Science, BioBlitz, and Discovery Labs: building on KBRR education and outreach strengths

- Information building blocks will be included in Discovery Labs
- Dedicated training on inventory and monitoring techniques for Citizen Science support
- Working hand in hand with staff biologists
- Providing opportunities to students